Faculty Working Papers

THE UNNEEDED BEHEMOTH

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College of Commerce and Business Administration
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July 30, 1974

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Over the past twenty eight years the federal government has spent one trillion seven hundred billion dollars purchasing final goods and services. Of this total a surprising one trillion three hundred billion, or about 80 percent, was spent on national defense.[1] Despite this massive flow of arms spending, a flow which has risen steadily and irreversibly from a healthy $15 bill. per annum in 1946 to a prodigious $74 bill. in 1973, the US now has less security, less defense against attack, than ever before.[2] The steady three decade long decline of national security is due, of course, to the development of nuclear warheads and missile delivery systems by both the US and USSR. The very high and still rising cost of this lack of security, though, is in large part due to the Pentagon's proclivity to purchase hugh, enormously expensive, but relatively ineffective weapons systems which add much to society's tax burden but little or nothing to its security. History provides us with many examples of the Pentagon's wasteful procurement practices, but the multibillion dollar Trident submarine program now being funded by Congress illustrates most perfectly the unwise arms buying policies of the defense establishment.

Although the Trident submarine program has been under way for some years, it is just now beginning to take rapidly growing multibillion dollar yearly bites out of the public

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purse.[3] The essential features of this eagerly sought and forcefully pushed system involve (a) constructing 10 hugh nuclear powered ballistic missile submarines, (b) equiping each of these submarines with 24 new long range missiles called the C-4, and (c) basing all ten submarines at a new facility to be built on the west coast at Bangor, Washington. Assuming no cost over-runs, the total investment or capital cost of this program is presently estimated to be $13.5 bill., making it the most expensive weapons system ever proposed by the Department of Defense. In addition, the ten year operating and maintenance cost of this 10 ship fleet has been calculated to be in the neighborhood of $4.4 bill.[4]

The 24 C-4 ballistic missiles to be carried aboard each Trident submarine will have a range of over 4,000 miles, which is just about twice the range of the Navy's current missiles. Each C-4 missile will be armed with 17 independently targeted nuclear warheads, giving each Trident submarine the capacity to attack 408 (24x17) different cities. When the entire fleet is completed early in the next decade, it will carry an astounding 4,080 (10x24x17) independently targeted nuclear weapons and so be able to destroy that many different cities from a distance of over 4,000 miles. Not only will the Trident be the single most expensive weapons system ever produced, it will also be one of the most devastating man has ever developed.

The first Trident is scheduled to be completed in 1978, with the tenth coming along late in 1983. Current plans

call for the 10 Tridents to replace 10 now operating Polaris submarines. Each of the to-be-replaced Polaris submarines carries 16 ballistic missiles having a range of 2,500 miles. The 16 missiles carried aboard each Polaris, though, are armed with three non-independently targeted nuclear weapons. Thus, in marked contrast to the planned Trident fleet, the Polaris fleet can attack only 160 cities from a distance of 2,500 miles. The ten year operating and maintenance cost of this fleet is estimated to be in the neighborhood of $1.6 bill.[5] All in all, the Navy's plan to replace 10 Polaris submarines with 10 Tridents would add 3,920 [-(10x16) + (10x24x17)] independently targeted nuclear warheads to their strategic offensive forces. The dollar cost to society of this further deep plunge into the presently unknown reaches of nuclear weaponery would be the $13.5 bill. capital cost plus the $2.8 bill. incremental ten year operating and maintenance cost of the Trident fleet over the Polaris fleet.

When completed, the 10 Tridents will be added to an already existing fleet of 31 Poseidon ballistic missile submarines. Each of these latter submarines carries 16 C-3 missiles which also have a range of 2,500 miles but are armed with 10 independently targeted nuclear warheads. Thus each Poseidon is capable of attacking 160 different cities, and when this fleet is completed in 1976, it will carry 4,960 (31x16x10) independently targeted nuclear warheads and so be able to attack that many different cities. Adding 10 Tridents and subtracting 10 Polaris submarines will then move the Navy from a Polaris-Poseidon fleet capable of destroying 5,120

cities to a Poseidon-Trident fleet capable of destroying 9,040 cities!

According to the Navy the main advantages of having the Trident fleet would be (a) the 3,920 additional nuclear weapons this system would add to its strategic forces, (b) the longer range of the new C-4 missile, and (c) the relative quietness of the Trident submarine. We shall examine each of these claimed advantages in turn, and attempt to assess the contribution, positive or negative, the Trident might be expected to make to national security.

To appraise the strategic worth of the 3,920 additional ready-to-fire nuclear weapons the Trident will add to the Navy's offensive forces, we refer to the accompanying chart which displays the expected effect of a US nuclear attack on the USSR.[6] The horizontal axis of this diagram measures the number of nuclear warheads delivered by the US while the vertical axis plots easily calculable Soviet fatalities as a percentage of their total population. The curve OA shown rising through the chart graphs expected Soviet fatalities as a function of the number of US delivered warheads. As shown, this curve rises very sharply as high density population centers and industrial concentrations are targeted to begin with. The function then levels off rapidly after the larger cities of the USSR have been struck and "low value" towns are targeted. The flattening out of the function OA simply reflects the fact that there are only 200 cities in the USSR with a population of over 100,000, and just 1,000 cities and towns of 20,000 and over.[7] Once these

first thousand cities and towns have been destroyed, few targets worthy of a nuclear weapon remain. With few targets remaining, it follows that the damage inflicting capability, or marginal kill productivity, of additional nuclear warheads approaches zero.

The chart also shows that by the end of 1973 the Soviets had 2,300 nuclear weapons (point S) and the US 7,100 warheads (point P) in their strategic forces. What is not shown is that because of the weapons systems now being funded by Congress, the US will have 7,900 nuclear warheads in its strategic forces by the middle of this year and well over 18,000 by the end of 1987.[8]

The curve OA points out that for the purposes of nuclear deterrence, both the US and the USSR possess a vast overabundance of weapons. Assuming a policy of nuclear deterrence through assured destruction requires no more than 250 independently targeted nuclear warheads as Rathjens and Kistiakowsky argue,[9] then the US already possess overkill to a factor of 28 and the Soviets to a factor of 10. Similarly, if deterrence requires no more than 10 weapons as Herbert York suggests,[10] then the US has 700 and the Soviets 230 times as many weapons as they need. No matter what measure one employs to define a sufficient deterrence, the curve OA makes it clear that a vast inventory of overkill exists on both sides of the ocean. As a result of this extreme overabundance, the nuclear balance of power between the US and USSR is remarkably insensitive to even large changes in the numbers of warheads held by either

country. Both the US and the USSR could half or double their inventories without much affecting the damage they could inflict on their opponent, and without affecting at all the value of their respective deterrences. Even though the nuclear balance is highly stable, the fact that it is lodged at such a high weapons count means that if for some reason the policy of mutual deterrence should fail, the consequences for the Northern Hemisphere would be altogether disasterous. A failure in deterrence at a low level of weaponery would not be nearly so devastating, while failure at a zero weapons level would not, of course, be threatening to either the US or USSR.

Disregarding the rapid build up of additional nuclear weapons by the land based ICBM and B-52 bomber components of US strategic forces, the Trident program alone would move the US inventory to a figure of 11,020 warheads (point H on OA). Since these additional weapons are incapable of either inflicting additional damage on the USSR or of improving the effectiveness of our deterrence, these 3,920 additional weapons are of zero military value at best. Thus, even if the Trident submarine, its missiles, and its base were free goods, no rational defense planner would recommend adding even a single warhead to our presently excessive stock. Certainly no rational defense planner would recommend adding 4,000 weapons to our stock at a cost to society of over thirteen billion dollars.

Even though the Trident program is on these grounds alone a grievous waste of scarce resources, Congress already has authorized some $3 bill. for this system. And with the

program now well under way, the Department of Defense is asking Congress for an additional $1.4 bill. for the submarine and $660 mill. more for the development of the C-4 missile for fiscal year 1975.[11]

A second argument made in support of the Trident has to do with the longer range of its missile. The 4,000 plus mile range of the C-4 will give the Trident some $4\frac{1}{2}$ times as much ocean in which to operate while still being able to attack its targets in the USSR. This greatly increased area of operations will make the Trident less susceptable to enemy detection and destruction, and so more assuredly preserve the second strike nuclear deterrence of the US. The trouble with this argument, however, is that this very real advantage is a function not of the Trident submarine but of the C-4 missile. The existing Poseidon fleet too could be given $4\frac{1}{2}$ times as much ocean in which to hide by the relatively inexpensive option of mounting the C-4 directly into the Poseidon. Doing this would, on the one hand, save up to $10 bill. in submarine costs and $500 mill. in base development costs, and, on the other hand, give the Navy a more valuable fleet at an early date.

That this relatively inexpensive measure is eminently feasible follows first from the fact that the Navy plans to test fire the C-4 from a Poseidon hull, and, secondly, after the Trident fleet has been completed and outfitted with 240 C-4 missiles, the Navy plans to develop a much larger longer range missile called the D-5 for the Trident. As the D-5

becomes available to the Trident, the bumped C-4's will be placed aboard 15 or more Poseidon submarines. Thus there is no question but that the C-4 can be mounted directly into the Navy's existing submarine hulls. Although the Navy has no doubts whatsoever concerning the invulnerability of its present submarine fleet, it follows that if it wants a hedge against future Soviet anti-submarine developments, it would be well to drop the Trident, accelerate the development of the C-4 missile and place it directly aboard the Poseidon fleet.

In addition to saving in the order of $11 bill. in public funds, exercising this option would provide the Navy with a Poseidon-C-4 fleet superior to the Trident fleet in two important respects. First, it would be less vulnerable to enemy attack simply because 15 or more Poseidons deploying from a number of existing bases would be much more difficult for Soviet anti-submarine forces to trail than would 10 hugh Tridents all emerging through narrow waters from a single base at Bangor, Washington. Secondly, the C-4 equiped Poseidon fleet would be available to the Navy at a much earlier date than would the C-4 equiped Trident fleet.

A final argument in support of the Trident is that it will run quieter and so be less vulnerable to detection and destruction than the Navy's current submarines. What is not pointed out is that improvements in quietness, propulsion, etc. could be made on the existing Poseidon fleet at a relatively low cost.[12] Doing the latter would also help give the Navy an improved submarine fleet years before the unneeded Trident

becomes available.

Judged bluntly, building the $13.5 bill. Trident submarine system will contribute nothing whatsoever either to the offensive capability of our strategic forces or to their value as a deterrent to nuclear war. Instead, the Trident will decrease national security by depriving society of the resources needed to deal effectively with its pressing domestic problems, by financially crowding-out relatively inexpensive but effective improvements in existing weapons systems, and by forcing the USSR toward further improvements in its own offensive forces.

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Footnotes

1. Council of Economic Advisors, Annual Report, Feb. 1974, p. 249.

2. US, Congress, Senate, Committee on Foreign Relations, ABM, MIRV, SALT, AND THE NUCLEAR ARMS RACE, Statement of Herbert York, 91st Cong., 2nd sess., 1970, pp. 58-65.

3. US, Department of Defense, Program Acquisition Costs by Weapon System, Fiscal Year 1975, pp. 36, 54.

4. Center for Defense Information, The Defense Monitor, Vol. 2, Number 4, Sept. 1973, pp. 1-8.

5. Ibid.

6. G.W. Rathjens and G.B. Kistiakowsky, "The Limitation of Strategic Arms," Scientific American, Jan. 1970, pp. 19-29. Reprinted as Chapter 22 in Arms Control, Herbert York, ed., San Francisco, W.H. Freeman and Co., 1973, pp. 201-11. See also A.C. Enthoven and K.W. Smith, How Much is Enough?, New York, Harper and Row, 1971, p. 207.

7. Center for Defense Information, The Defense Monitor, Vol. 2, Number 1, Jan. 1973, p. 1.

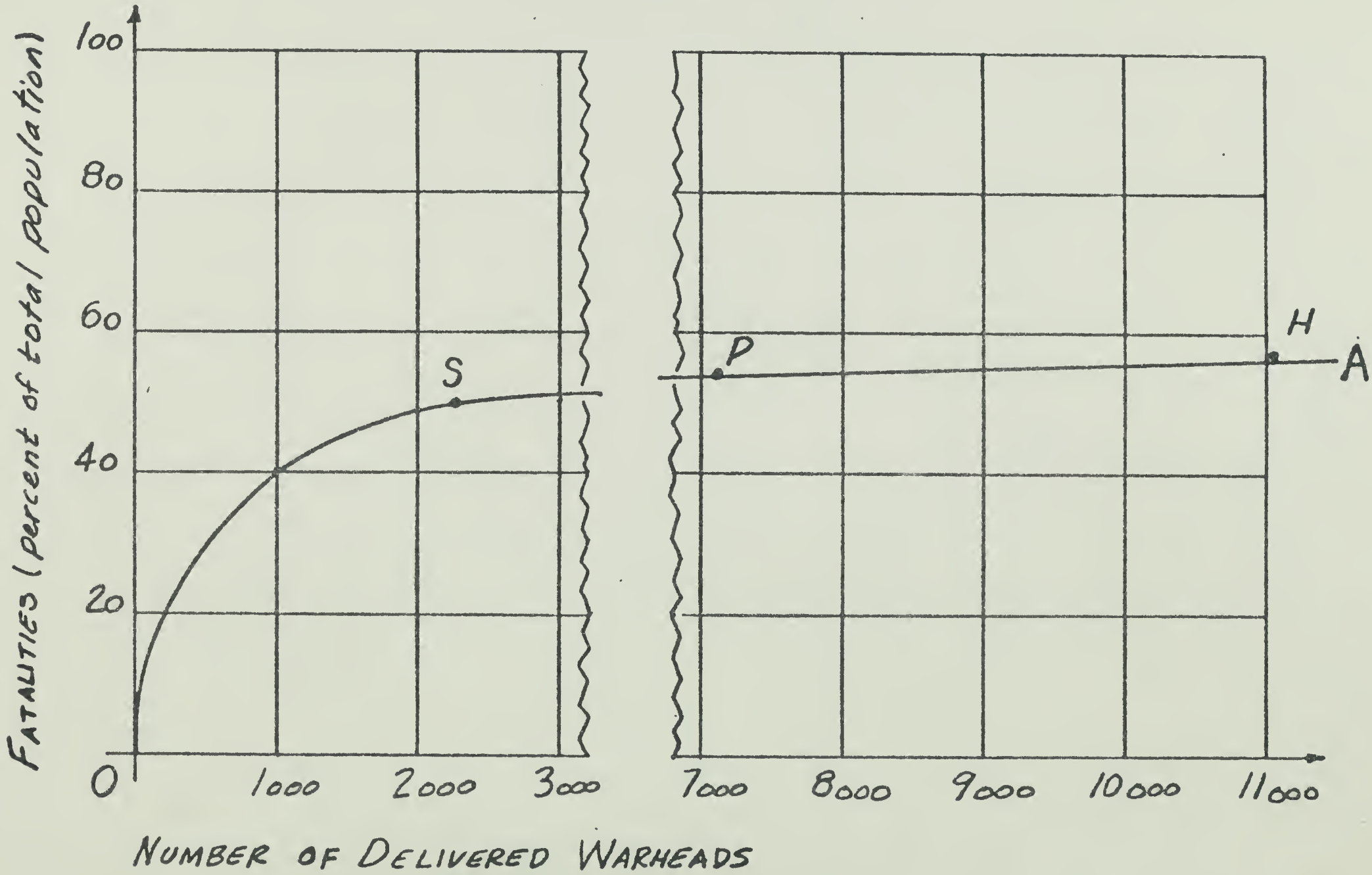
8. US, Department of Defense, Annual Report of the Secretary of Defense for Fiscal Year 1975, p. 50.

9. Rathjens and Kistiakowsky, p. 20.

10. H.F. York, "Deterrence by Means of Mass Destruction," Science and Public Affairs, March 1974, pp. 1-9.

11. Program Acquisition Costs, p. ii.

12. US, Congress, Senate, Committee on Armed Services, Fiscal Year 1975 Authorizations for Military Procurement, Statement by R.L. Garwin, 93rd. Cong., 1st sess., pp. 1755-1769.


FATALITIES (percent of total population)
100
80
60
40
20
0
1000
2000
3000
7000
8000
9000
10000
11000
S
P
H
A
NUMBER OF DELIVERED WARHEADS

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